Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1 -11 (Cancelled)

Claim 12 (Currently Amended): The damper of ~~claim 35~~ claim 40 wherein said ~~processing structure~~ computing system calculates the frequency and amplitude of said first mass and oscillation of each said ~~shaft~~ sheath and the phase differential between said first mass ~~to said shaft~~ and each said sheath.

Claim 13 (Currently Amended): The damper of ~~claim 35~~ claim 40 wherein said ~~processing structure~~ computing system further comprises at least one spectrum analyzer per accelerometer.

Claim 14 (Cancelled)

Claim 15 (Currently Amended): The method of ~~claim 35~~ claim 40 wherein said ~~processing structure~~ computing system generates a dampening spring stiffness signal that decreases said electromagnetic ~~bond if~~ bond when the amplitude of oscillation of each said ~~shaft~~ sheath is increasing and the amplitude of oscillation of said first mass is decreasing, and generates a dampening spring stiffness signal that increases said electromagnetic ~~bond if~~ bond when the amplitude of oscillation of each said ~~shaft~~ sheath is decreasing and the amplitude of oscillation of said first mass is increasing.

Claims 16-27 (Cancelled)

Claim 28 (Currently Amended): A damper for mitigating torsional vibration of a shaft rotating with an angular velocity about a longintudinal axis, said damper comprising:

a first mass radially outward of said shaft, said first mass oscillating along an arcuate path in a plane perpendicular to said axis;

a passive dampening element coupled to said first mass and to said shaft;

a second mass radially outward of said first mass;

an adjustable dampening element coupled to said second mass and to said first mass; and

a feedback circuit detecting ~~relative~~ movement ~~between said shaft and~~ of said first mass resulting from undesired torsional vibration of said shaft and in response, adjusting the stiffness of said adjustable dampening element thereby to dampen said torsional vibration.

Claim 29 (Previously Presented): The damper of claim 28 wherein said first and second masses are concentric rings.

Claim 30 (Previously Presented): The damper of claim 29 wherein said passive dampening element comprises diametric first and second spring segments extending between said first mass and said shaft.

Claim 31 (Previously Presented): The damper of claim 30 wherein said first and second spring segments are affixed to a hub that is secured to said shaft.

Claim 32 (Previously Presented): The damper of claim 29 wherein said active dampening element comprises diametric first and second active spring segments extending between said second mass and said first mass.

Claim 33 (Previously Presented): The damper of claim 32 wherein each of said first and second active spring segments comprises a sheath at one end through which said first mass passes.

Claim 34 (Cancelled)

Claim 35 (Currently Amended): A damper for reducing torsional vibration of a shaft rotating about its longitudinal axis, said damper comprising:

a first mass radially outward of said shaft, said first mass oscillating along an arcuate path in a plane perpendicular to said axis;

a first spring physically coupled to said first mass and to said shaft;

a second mass radially outward of said first mass;

a second spring physically coupled to said second mass and coupled to said first mass via an adjustable electromagnetic bond;

accelerometers coupled to the first mass and ~~the shaft and~~ outputting signals in response to acceleration of said first mass ~~and said shaft~~ resulting from undesirable torsional vibration of said shaft;

a ~~processor~~ computing system communicating with said accelerometers, said ~~processor structure~~ computing system processing said signals and generating a dampening spring stiffness signal; and

a current generator communicating with said ~~processor~~ computing system, said current generator, in response to said dampening spring stiffness signal, adjusting the electromagnetic bond thereby to dampen said torsional vibration.

Claim 36 (Previously Presented): The damper of claim 35 wherein said first and second masses are concentric rings.

Claim 37 (Previously Presented): The damper of claim 36 wherein said first spring comprises diametric first and second spring segments extending between said first mass and said shaft.

Claim 38 (Previously Presented): The damper of claim 35 wherein said first and second spring segments are affixed to a hub that is secured to said shaft.

Claim 39 (Previously Presented): The damper of claim 35 wherein said second spring comprises diametric first and second active spring segments extending between said second mass and said first mass.

Claim 40 (Previously Presented): The damper of claim 39 wherein each of said first and second active spring segments comprises a sheath at one end through which said first mass passes.

Claim 41 (Previously Presented): A method of damping torsional vibration of a shaft rotating about its longitudinal axis using a damper, said damper comprising a first mass radially outward of said shaft and physically coupled to said shaft via a first spring and a second mass radially outward of said first mass and coupled to said first mass via a second spring and an electromagnetic bond, said method comprising:

(i) oscillating said first mass angularly with respect to said shaft in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs;

(ii) identifying harmonic motion in said first mass relative to said shaft as a result of undesired torsional vibration of said shaft;

(iii) calculating, in response to said harmonic motion identifying, current changes that, when applied by a current generator to said electromagnetic bond, adjust the strength of said electromagnetic bond thereby to change the total effective spring constant; and

(iv) applying the calculated current changes to said electromagnetic bond thereby to adjust its strength and dampen said torsional vibration.

Claim 42 (Currently Amended): A method for damping torsional vibrations of a rotating shaft wherein said shaft includes a hub, a first mass physically coupled to said hub via a first spring and a second mass coupled to said hub via a second spring and an electromagnetic bond, said method comprising:

(i) oscillating said first mass angularly with respect to said hub in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs;

(ii) identifying undesired harmonic motion in said first mass relative to said hub;

(iii) calculating applied current changes that, when applied by a current generator to said electromagnetic bond, change the total effective spring constant and improve dampening of the detected undesired harmonic motion; and

(iv) applying said current changes to said electromagnetic bond, wherein said calculating comprises:

calculating a current ~~decrease if~~ decrease when the amplitude of oscillation of said hub is increasing and amplitude of oscillation of said first mass is decreasing; and

calculating a current ~~increase if~~ increase when the oscillation of said hub is decreasing and oscillation of said first mass is increasing.

Claim 43 (Currently Amended): A method for damping torsional vibrations of a rotating shaft wherein said shaft includes a hub, a first mass physically coupled to said hub via a first spring and a second mass coupled to said hub via a second spring and an electromagnetic bond, said method comprising:

(i) oscillating said first mass angularly with respect to said hub in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs;

(ii) identifying undesired harmonic motion in said first mass relative to said hub;

(iii) calculating applied current changes that, when applied by a current generator to said electromagnetic bond, change the total effective spring constant and improve dampening of the detected undesired harmonic motion; and

(iv) applying said current changes to said electromagnetic bond, wherein said calculating comprises:

calculating a current decrease and mass amplitude ~~increase if~~ decrease when the amplitude of oscillation of said hub is increasing; and

calculating a current increase and mass amplitude ~~increase if~~ increase when the amplitude of oscillation of said hub is decreasing.